

BLUEBUNCH WHEATGRASS

Pseudoroegneria spicata (Pursh)

A. Löve

Plant Symbol = PSSP6

Contributed by: USDA NRCS Idaho Plant Materials Program



Bluebunch wheatgrass seed production field at Aberdeen, Idaho. Photo by Derek Tilley, USDA-NRCS

Alternate Names *Agropyron spicatum*, *Elytrigia spicata*

Uses

Bluebunch wheatgrass can be used for native hay production and will make nutritious feed, but is better suited to grazing use. Bluebunch wheatgrass is palatable to all classes of livestock and wildlife. In spring, the protein levels can be as high as 20 percent decreasing to about 4 percent protein as the forage matures and cures. Digestible carbohydrates remain about 45 percent throughout the active growth period.

Bluebunch wheatgrass is very drought resistant, persistent and adapted to stabilization of disturbed soils. It is very compatible with slower developing native grasses, but does not compete well with aggressive introduced species. Its drought tolerance, combined with extensive root systems and good seedling vigor, make this species ideal for reclamation in areas receiving 10 to 20 inches annual precipitation.

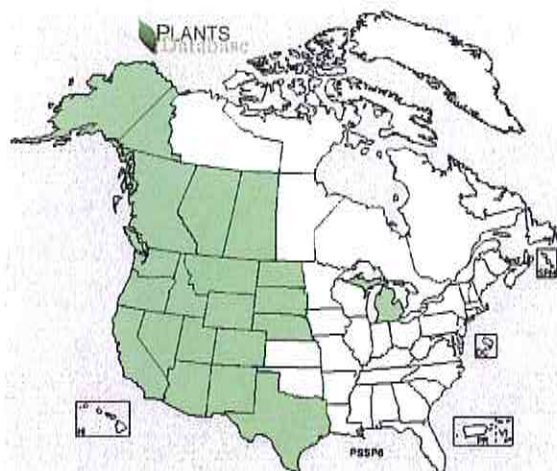
Status

Consult the PLANTS Web site and your State Department of Natural Resources for this plant's current status (e.g., threatened or endangered species, state noxious status, and wetland indicator values).

Description and Adaptation

Bluebunch wheatgrass is a long-lived, cool-season native perennial bunchgrass growing to 4 feet tall with seed spikes 3 to 8 inches long. The lemma awns range from being short to prominent and divergent except on the beardless type where the awn is lacking. It has an extensive root system with strong tillers. Bluebunch wheatgrass spreads by seed but in high rainfall zones it may spread by short rhizomes.

Bluebunch wheatgrass is common to the northern Great Plains, Northern Rocky Mountains and the Intermountain regions of the western United States. For updated distribution, please consult the Plant Profile page for this species on the PLANTS Web site.



Bluebunch wheatgrass distribution from USDA-NRCS PLANTS Database.

Bluebunch wheatgrass does best on medium to coarse-textured soils, but can be found on a range of soil textures over 10 inches deep. It will tolerate weakly saline

conditions but does not grow on highly acidic sites. It is cold tolerant, moderately shade tolerant, and highly fire tolerant. It is not tolerant of high water tables, poor drainage, or periods of extended inundation.

Bluebunch wheatgrass is most abundant in 10 to 20 inch annual precipitation areas in sagebrush and juniper communities. The elevation range is from 500 to 10,000 feet above sea level. It is a major component of many native plant communities and generally occupies 20 to 60 percent of the overall composition by weight.

Establishment

Seed should be drilled at a depth of 1/4 to 1/2 inch into a clean, firm, weed-free seedbed. The single-species seeding rate is 8 pounds Pure Live Seed (PLS) per acre. If used as a component of a mix, adjust to percent of mix desired. When broadcast seeding and for mine lands and other harsh critical areas, the seeding rate should be doubled. Bluebunch wheatgrass is compatible with other native species and should be used in seeding mixtures. It should not be seeded with strongly competitive introduced species. Best seeding results are obtained from seeding in early spring on heavy to medium-textured soils and in late fall on medium to light-textured soils. Late summer (August - mid September) seeding is not recommended unless irrigation is available.

Management

Grazing should be deferred for 2-3 years to ensure establishment. Established stands do not tolerate heavy continuous grazing, and six inches of new growth should be attained in spring before grazing is allowed. Deferred rotation grazing is recommended. Spring grazing should occur no more than one out of three years and less than 40% utilization should occur during rapid growth. Heavy early spring grazing is especially damaging and grazing should be delayed until at least mid-boot stage. No more than 60% utilization should occur after seed ripens.

Environmental Concerns

Bluebunch wheatgrass is native to the Intermountain West and has no known negative impacts on wild or domestic animals. It is not considered a weedy or invasive species but can spread to adjoining vegetative communities under ideal environmental conditions.

Cultivars, Improved, and Selected Materials (and area of origin)

Anatone Selected Class Germplasm originated near Anatone, Washington. It was released by the Forest Service, BLM, Aberdeen PMC, Idaho-Utah AES, ARS and the Utah Division of Wildlife Resources in 2003. Anatone establishes rapidly and can survive under dry conditions at or above 10 inches rainfall. It is intended for use on rangelands for re-establishment of native plant

communities, vegetative firebreaks, and critical area stabilization. Certified seed is available. Generation 1 seed is produced by Aberdeen PMC.

'Goldar' was selected from seed collected on Mallery Ridge in Asotin County, Washington. It was released by Idaho-Utah AES, ARS and the Aberdeen PMC in 1989. 'Goldar' is noted for rapid establishment, high forage production, and the ability to survive with 12 inches precipitation. Certified seed is available and Breeder and Foundation seed is maintained by Aberdeen PMC.

P-7 Selected Germplasm was generated by open-pollinating 25 native populations of bluebunch wheatgrass resulting in high genetic diversity. ARS and the Utah AES released P-7 in 2001. It is expected to survive and thrive under dry conditions at or above 12 inches rainfall. Certified seed is available and early generation seed is maintained by USDA-ARS, Logan, Utah.

'Whitmar' a cultivar of beardless wheatgrass (*P. spicata* subsp. *inermis*) is the awnless form of bluebunch wheatgrass. It was selected from seed native to the Palouse grasslands near Colton, Washington. Idaho-Oregon-Washington AES and Aberdeen, Corvallis, and Pullman PMCs released 'Whitmar' in 1946. It performs best above 12 inches rainfall. 'Whitmar' was selected for forage quality, seedling vigor, and good seed production. Certified seed is available and Breeder seed is maintained by Pullman PMC.

Prepared By

Derek Tilley; USDA NRCS Plant Materials Center, Aberdeen, Idaho.

Loren St. John, USDA NRCS Plant Materials Center, Aberdeen, Idaho.

Citation

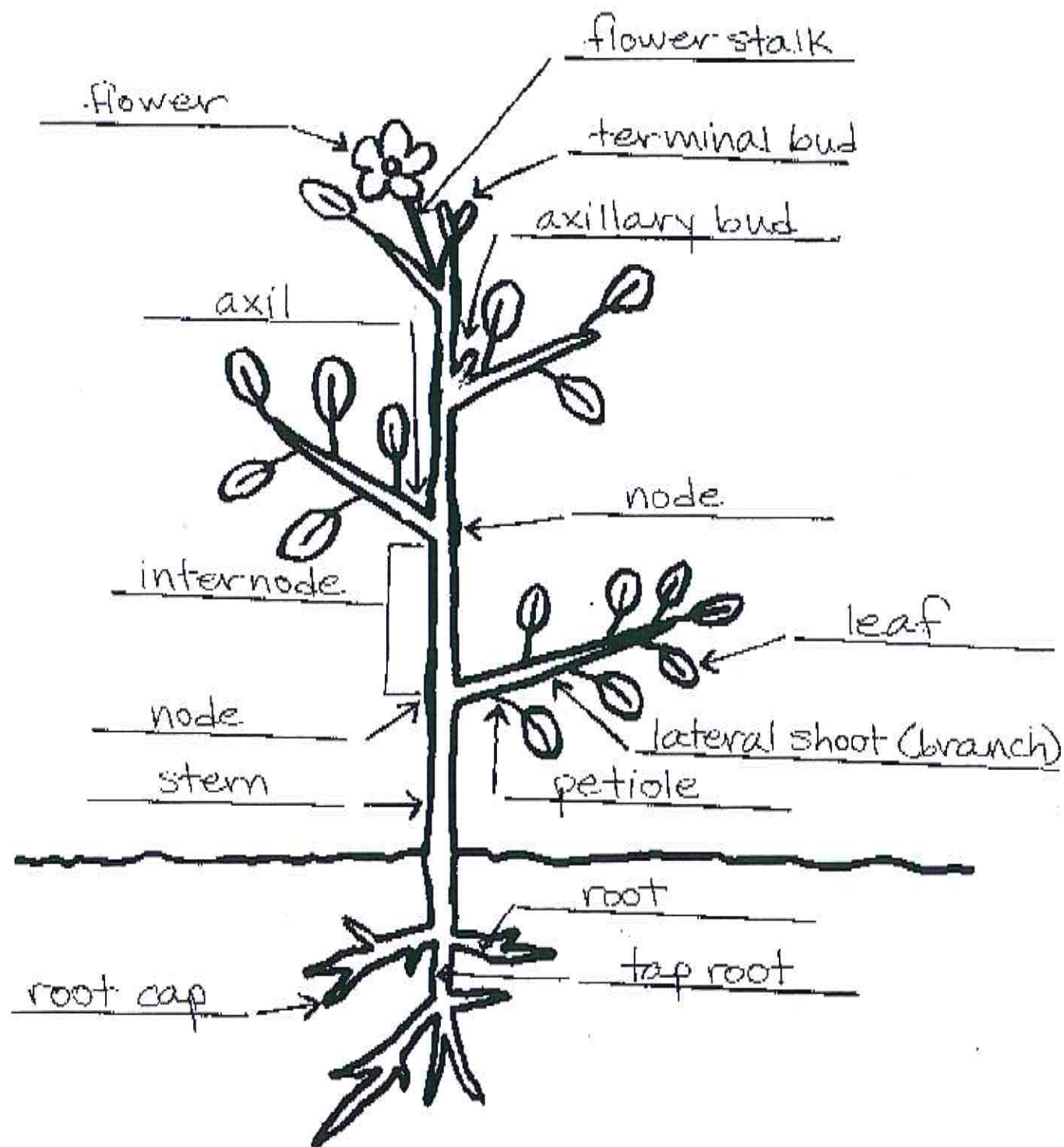
Tilley, D., and L. St. John. 2013. Plant fact sheet for bluebunch wheatgrass (*Pseudoroegneria spicata*). USDA-Natural Resources Conservation Service, Aberdeen Plant Materials Center, Aberdeen, Idaho

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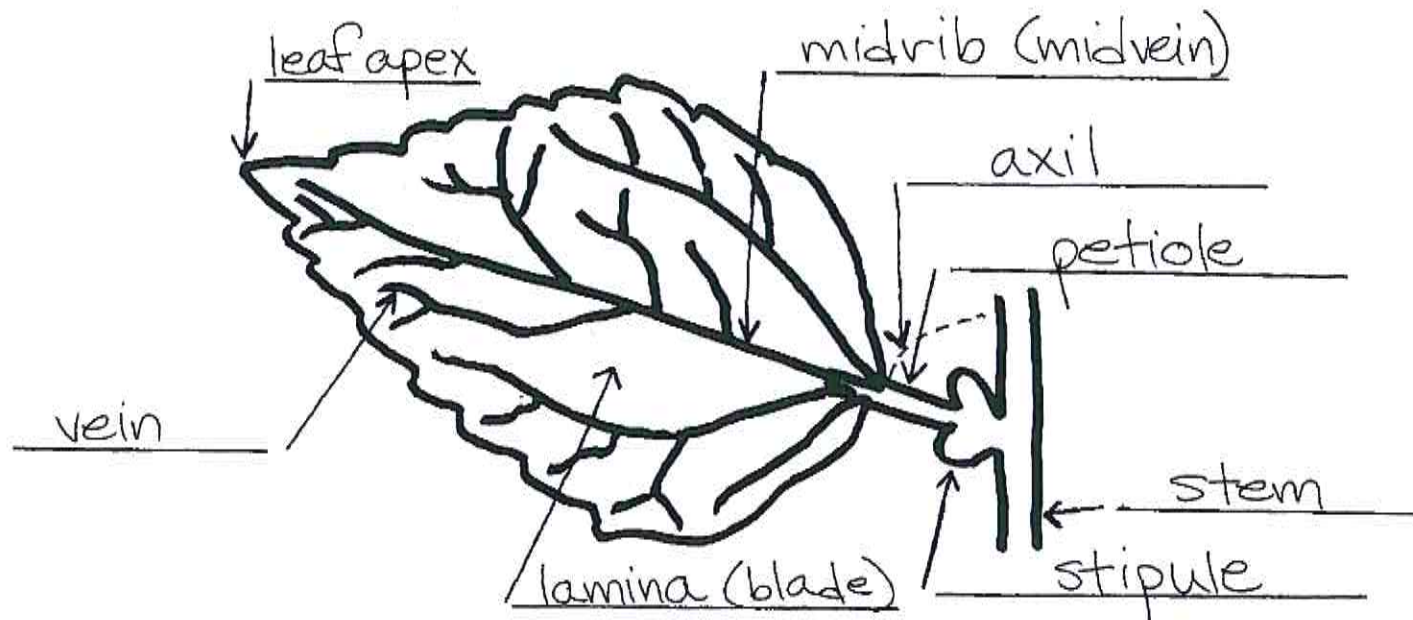
Edited: 19dec2012djt; 19dec2012ls

For more information about this and other plants, please contact your local NRCS field office or Conservation District <<http://www.nrcs.usda.gov/>>, and visit the PLANTS Web site <<http://plants.usda.gov>> or the Plant Materials Program Web site <<http://plant-materials.nrcs.usda.gov>>

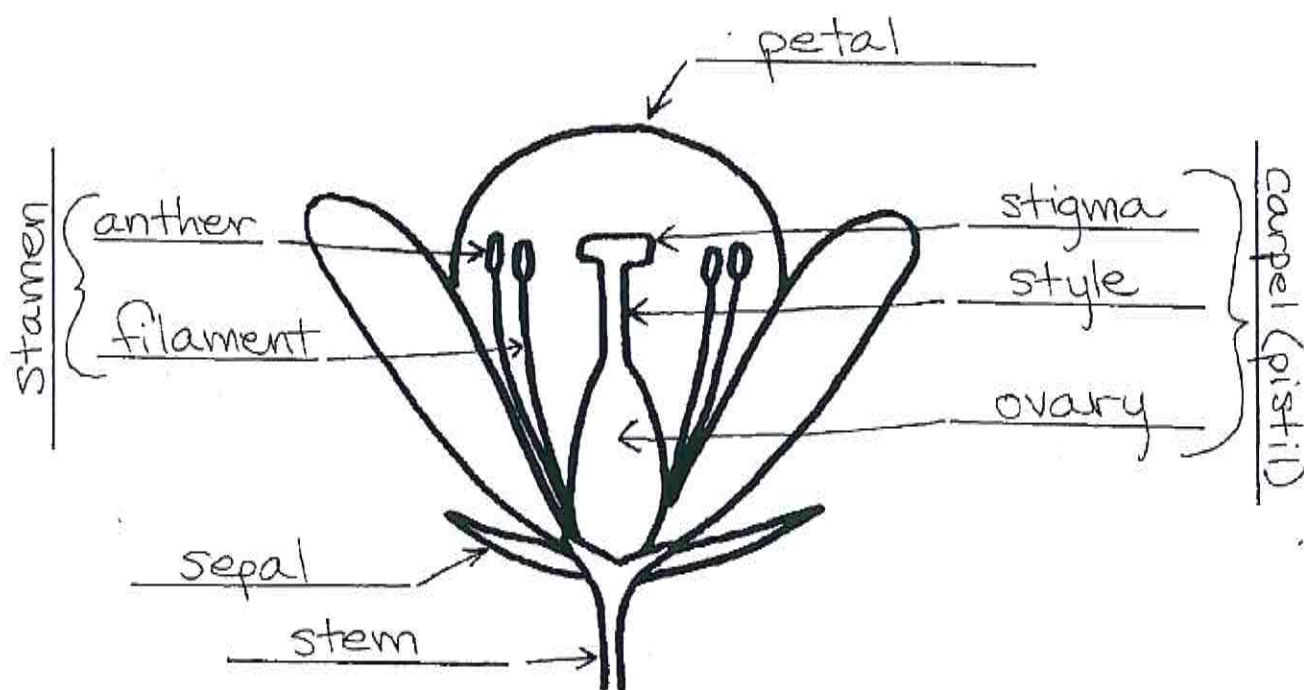
Answer Key for Plant Anatomy Diagram



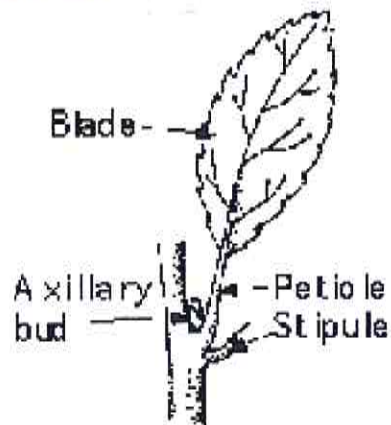
Answer Key for Simple Leaf Diagram



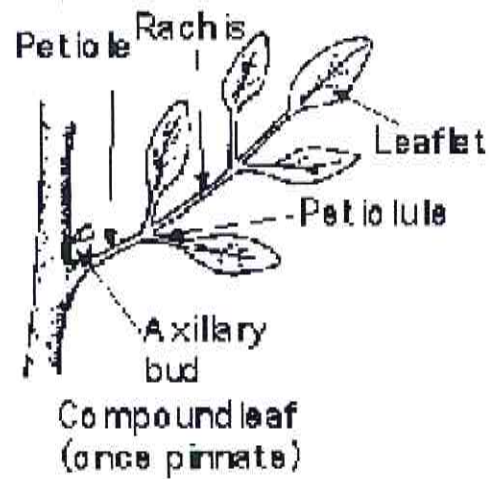
Answer Key for Flower Diagram



Leaf Types

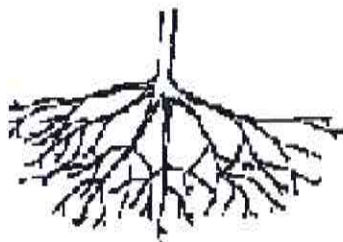


Simple leaf

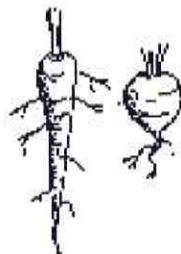


Compound leaf
(once pinnate)

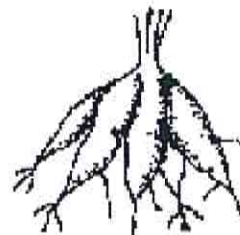
Root Types (the different types of root arrangements)



FIBROUS

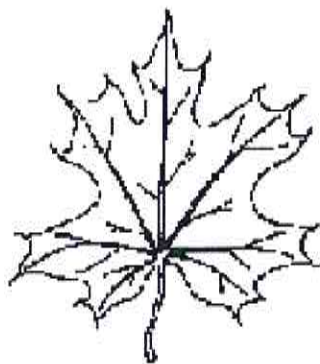


TAP

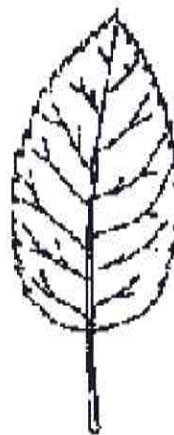


TUBEROUS

Leaf Venation (how the veins of the leaf are arranged)



Palmately
Veined



Pinnately
Veined



Parallel

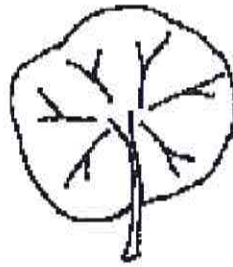
Leaf Shapes (what the shape of the leaf is)



Obovate



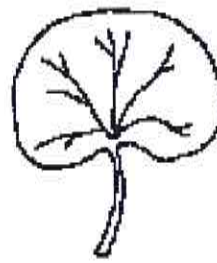
Ovate



Peltate



Perfoliate



Reniform

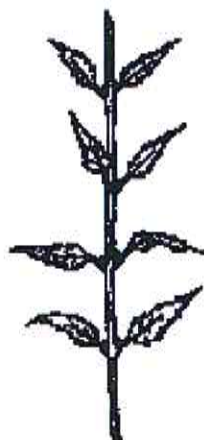


Spathulate

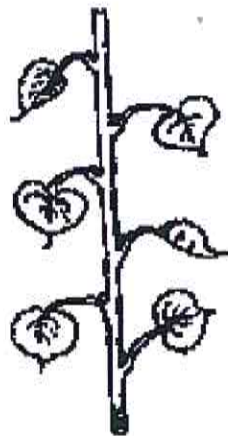


Subulate

Leaf Arrangement (how the leaves are arranged on the stem)



Opposite



Alternate



Whorled



Imbricate

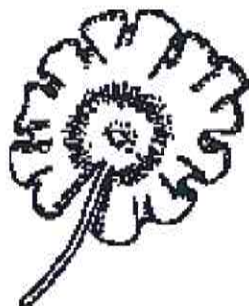


Fasicled

Leaf Margins (what the edges of the leaves look like)



Entire



Undulate



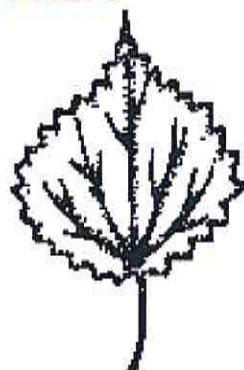
Crenate



Serrate



Double-Serrate



Dentate



Denticulate



Ciliate



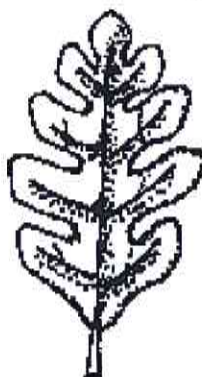
Incised



Lacerate



Lacinate



Lobed



Cleft



Parted



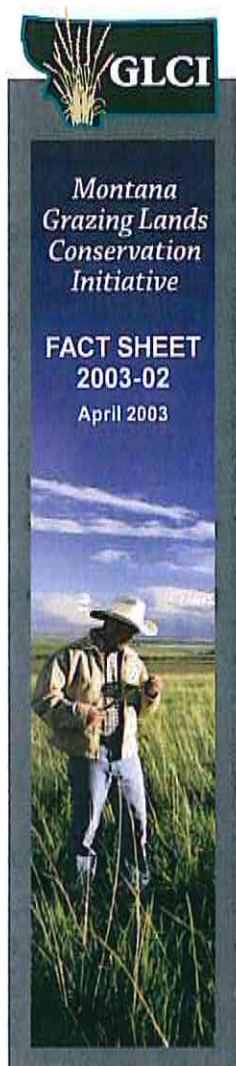
Pinnatifid



Palmatifid



Crispate



"Strengthening partnerships and encouraging diversification to maintain or improve private grazing land resources through grassroots efforts and interagency technical assistance."

Livestock and Big Game Use of Grazing Lands

Tara Fisher, MSU Animal & Range Extension Associate
 Gene Surber, MSU Extension Natural Resources Specialist
 Julie Sacks, NRCS District Conservationist
 Lisa Schmidt, Editor, Western Farmer/Stockman magazine

Introduction

Big game wildlife population increases have been reported in southwestern Montana over the past few decades (Montana Department of Fish, Wildlife & Parks data). This, along with shortages of year-round habitat on public lands and increased development on private lands (Wisdom and Thomas 1996), has caused increased use of private grazing lands. Big game wildlife species use private grazing lands, as well as public lands, and compete with livestock for forage, utilize stored hay, and damage fences (Lacey *et al.* 1993). This poses conflicts with ranchers who rely on their private grazing land resources to support livestock.

Livestock grazing may alter succession and productivity of the plant community affecting forage and cover for wildlife in a desirable or undesirable manner (Peek and Krausman 1996). Research through Montana State University conducted on the Blackfoot Clearwater Wildlife management area, has shown wildlife habitat improvement with the use of fall cattle grazing. Up to 70% use removed unpalatable standing dead material, increasing the percentage of green vegetation the following spring without degrading the range (Short and Knight 2003). The presence of livestock may also alter distribution patterns and habitat use of wildlife species (Peek and Krausman 1996, Wisdom and Thomas 1996).

According to the 1994 Farm and Ranch Survey Summary (Saltiel and Faulkner 1994), over half of the respondents (54%) indicated that game animals seldom caused damage, 34% indicated there was serious damage in some years, and 11% indicated serious damage in most years.

The Headwaters Resource Conservation & Development (RC&D) Big Game Committee conducted a survey with 858 landowners in southwestern Montana in 1989-1990 (Lacey *et al.* 1993). The majority of respondents to this survey reported that elk (*Cervus canadensis*), mule deer (*Odocoileus hemionus*), whitetail deer (*Odocoileus virginia*), and antelope (*Antilocapra americana*) populations had increased during the past ten years, and these species damage forage and crop yields. Areas that had higher populations were directly related to respondents desiring fewer numbers and allowing more hunting days on their private lands. Those respondents which were more dependent on agriculture also desired fewer animals than respondents with a more non-agricultural income source.

Surber and Alger conducted another survey (unpublished data), distributed to 50 ranches with 22 returned, in 1997 in cooperation with the Madison Conservation District. Although there were very few respondents, this survey indicated concerns over lost forage and reduced ability to manage grazing lands.

The Southwestern Montana Grazing Lands Conservation Initiative (GLCI) Committee developed a third survey and sent it out to 1,803 landowners in the spring of 1998. Two hundred and forty-five (14%) of those were returned. The southwestern Montana conservation districts chose to use this survey as a tool to develop workshops and promote local involvement in private land wildlife management. Demographic data indicated that the majority of respondents have from 100 to 2,500 acres of private grazing land under their control, do not utilize a public grazing allotment, have beef cows and horses, and ranch as their primary livelihood.

Results And Discussion

Results from the GLCI survey indicate how wildlife are utilizing private grazing land resources in southwestern Montana and landowner perspectives regarding use of their private lands by big game wildlife. It also indicates the interest of landowners in technical assistance through workshops to develop ideas for managing wildlife and livestock to conserve grazing land resources on private lands.

Overall, the majority of survey respondents (95%) in southwestern Montana indicated that their private land provides habitat for big game species in some way. Just over half (7) of those whose land does not provide habitat for big game own from 1 to 50 acres, three others own from 51 to 100 acres, and two own from 101 to 500 acres. One of the latter is strictly a grain producer so habitat would be limited for big game. Although big game may utilize the 1- to 50-acreage ownerships, they may not provide a significant source of habitat other than forage; but this is highly dependent on the type of cover present.



Antelope and deer.

The majority of survey respondents have both white-tail (83%) and mule deer (74%) utilizing their private lands, while antelope and elk were sighted by roughly half of the respondents. This could be a result of deer utilizing more open areas so they are more readily seen, whereas elk and moose stay closer to the edge of different habitats where brush is available for hiding cover. It could also be due to population changes over time.



Deer on hay.

Private land is not only used as a feed resource (range, 82%, and/or riparian, 58%), but also as various habitat attributes for survival, such as breeding (60%), calving and fawning grounds (66%), and as a migration route (36%). It should be noted that all resources of a farming/ranching operation which are critical to economic survival are utilized by big game species (i.e. hay fields, tame pastures, grain fields, hay stacks, etc.).

Respondents indicated that use of private land overlaps in all seasons for livestock and each big game species listed. These results are consistent with those discussed in the second paragraph above, in that whitetail and mule deer consistently have the greatest amount of overlap with livestock. Although use of private land by big game species overlaps throughout the year, it is considered to be tolerable by 74% and intolerable by 29% of the survey respondents who recognized big game to use their land. Three percent of the respondents feel there are aspects of big game use that are tolerable and intolerable. Tolerance to big game use declines from 100% for respondents with 100 or fewer private acres to 43% for respondents with 7,500-10,000 acres and increases again for respondents with 10,000 to 30,000 private acres. This could be because small acreage landowners do not depend on the resource for their livelihood and therefore consider the aesthetics more valuable. For very large acreage landowners the effects may not be as severe because they are spread over a larger area. It is quite apparent that the majority of even those respondents who depend on the resource for their livelihood consider big game use to be tolerable.

Research conducted through Montana State University on two southwestern Montana ranches indicates the effects of early and late spring grazing by elk on bluebunch wheatgrass, a native grass found on foothills rangeland (Brewer 2002). It was found that grazing in April did not decrease yield and vigor in June or July. Moderate grazing for 2 or more consecutive years in May decreased plant yield and vigor in June, and heavy spring grazing for three successive years decreased plant vigor in July. Implications of this research are that cattle grazing management does not need to be adjusted to compensate for elk use in April, but management needs to be altered if elk successively use areas in May that are needed for cattle in June or July. Of those respondents who feel big game use is intolerable and indicated that big game grazing interrupts their grazing schedule (game graze forage resources of some pastures before they are scheduled to be grazed according to their grazing system), 49% do not plan and 51% do plan, for big game use in their grazing land management plan. Of those survey respondents that feel big game grazing interrupts their grazing schedule, 56% indicated that their operation also includes a public grazing allotment, whereas 44% do not have an allotment. Even though public allotments are used as a grazing

resource by private landowners, big game still impact the use of private land, and interrupt grazing practices.

A similar percentage of survey respondents whose operation is their primary livelihood (40%) indicated that they plan for big game use in their management plan compared to those respondents whose operation is not their primary livelihood (38%). Big game use of private lands is recognized by landowners regardless of their own dependence on private land resources. Although less than half of survey respondents adjust management, big game still utilize private land at the expense of the resource.

Forty-five percent of survey respondents that feel big game use is tolerable consider the presence of big game to be a benefit since their family and friends hunt game species that use the private land. Only 5% consider revenue from hunting and/or outfitting services to compensate for the costs big game impose. This low percentage may be due to a lack of landowners that provide guided hunting and/or outfitting services, or a lack of landowners that charge sportsmen to use their private land. Of those landowners that consider the presence of big game to be a benefit because of the hunting opportunities, the majority agree (48%) and strongly agree (29%) that hunting is an effective big game management tool. Most of those who feel guided hunts and/or outfitting compensate for costs big game impose (89%) also feel that hunting is an effective management tool. On the other hand, 81% of survey respondents that consider big game use to be intolerable do not feel that the benefits big game provide compensate for their use of private land resources. Just over half of these respondents agree (36%) or strongly agree (21%) that hunting is an effective big game management tool. It is apparent that if landowners can perceive some benefit from hunting big game species, they are more likely to utilize hunting as a management tool (Teer 1996).

A majority of survey respondents who consider big game use of their private lands to be intolerable indicated that 1) big game use is excessive and has a significant impact on their operation (73%), and 2) the presence of big game on private property is part of nature; however, they do not have a voice in game management which allows excessive populations to interfere with management of their plant and water resources (72%). More than half of the landowners who responded to 1 and 2 above agree (54% and 59%, respectively) and strongly agree (11% and 9%, respectively) that they could manage big game grazing on their private property better with additional information and non-biased technical assistance. Even when big game use is considered intolerable, the majority of landowners realize it is part of nature and are willing to manage in order to reduce impacts big game impose.

Summary

Respondents to this survey of big game impacts on private grazing lands indicated that all big game species, especially whitetail and mule deer, elk, antelope and moose, use their private lands in some way. It is not only used as a feed resource, but various habitat attributes for survival as well. All resources important for the economic survival of a farming/ranching operation are utilized by big game species. Livestock and wildlife use overlaps on private lands throughout the year, but in spite of this, wildlife use is considered tolerable by the majority of respondents who recognized big game use on their land. Wildlife species still impact use by livestock on private lands even when public land allotments are being utilized. Only 40% of survey respondents plan for big game use in their grazing land management plan which indicates that big game are utilizing private land at the expense of the forage resource in some cases. Hunting is more likely to be used as a management tool



Elk trails to adjoining private lands.

if landowners can perceive some benefit from allowing hunting on their property. The majority of respondents that feel big game use is intolerable realize it is part of nature, but are frustrated because they do not have a say in wildlife management and feel they could manage better with additional unbiased information.

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The Montana Grazing Lands Conservation Initiative is supported by the following organizations and agencies:

American Sheep Industry, Montana Association of Conservation Districts, Montana Board of Livestock, Montana Department of Agriculture, Montana Department of Natural Resources and Conservation, Montana Farm Bureau, Western Farmer/Stockman Magazine, Montana Governor's Rangeland Resources Executive Committee, Montana State University College of Agriculture, Montana State University Extension Service, Montana Stock Growers Association, Natural Resources Conservation Service, The Nature Conservancy, Public Grazing Lands Council, Society for Range Management Northern Great Plains Section.